

Name : \_\_\_\_\_

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

## Integration by Parts

Find each indefinite integral using the substitution provided.

1)  $\int e^x \sin(x) dx$

$u = \sin(x); dv = e^x dx$

2)  $\int \ln(x + 5) dx$

$u = \ln(x + 5); dv = dx$

3)  $\int x^2 e^{4x} dx$

$u = x^2; dv = e^{4x} dx$

4)  $\int (4x + 2) \cos\left(\frac{x}{3}\right) dx$

$u = 4x + 2; dv = \cos\left(\frac{x}{3}\right) dx$

5)  $\int x^2 \cos(4x) dx$

$u = x^2; dv = \cos(4x) dx$

6)  $\int e^{-x} \cos(2x) dx$

$u = e^{-x}; dv = \cos(2x) dx$

7)  $\int \frac{\ln(x)}{x} dx$

$u = \ln(x); dv = \frac{1}{x^2} dx$

8)  $\int x \cos(x) dx$

$u = x; dv = \cos(x) dx$



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## Integration by Parts

Find each indefinite integral using the substitution provided.

1)  $\int e^x \sin(x) dx$

$$u = \sin(x); dv = e^x dx$$

$$\frac{1}{2} e^x (\sin(x) - \cos(x)) + C$$

2)  $\int \ln(x + 5) dx$

$$u = \ln(x + 5); dv = dx$$

$$(x + 5)\ln(x + 5) - x + C$$

3)  $\int x^2 e^{4x} dx$

$$u = x^2; dv = e^{4x} dx$$

$$\frac{x^2 e^{4x}}{4} - \frac{2x e^{4x}}{16} + \frac{2e^{4x}}{64} + C$$

4)  $\int (4x + 2)\cos\left(\frac{x}{3}\right) dx$

$$u = 4x + 2; dv = \cos\left(\frac{x}{3}\right) dx$$

$$(12x + 6) \sin\left(\frac{x}{3}\right) + 36 \cos\left(\frac{x}{3}\right) + C$$

5)  $\int x^2 \cos(4x) dx$

$$u = x^2; dv = \cos(4x) dx$$

$$\frac{x^2 \sin(4x)}{4} + \frac{2x \cos(4x)}{16} - \frac{2 \sin(4x)}{64} + C$$

6)  $\int e^{-x} \cos(2x) dx$

$$u = e^{-x}; dv = \cos(2x) dx$$

$$\frac{2 \sin(2x) - \cos(2x)}{5e^x} + C$$

7)  $\int \frac{\ln(x)}{x} dx$

$$u = \ln(x); dv = \frac{1}{x^2} dx$$

$$\frac{\ln^2(x)}{2} + C$$

8)  $\int x \cos(x) dx$

$$u = x; dv = \cos(x) dx$$

$$x \sin(x) + \cos(x) + C$$

